

IN MEMORIAM

J. R. KANTOR, 1888–1984

J. R. Kantor died on February 2, 1984. The following four articles were invited in memory of his many contributions to the field.

## J. R. Kantor's Contributions to Psychology and Philosophy: A Guide to Further Study

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The scientific community's almost total disregard for Kantor's contribution to Philosophy and Psychology is, in retrospect, extremely fortunate. Wide recognition and unabashed praise cannot help but influence the integrity of a scientist and impair his vision of the future. No such end came to Kantor's career. Nor did he lament his lack of recognition. He was well aware of the enormous change in intellectual orientation required for an appreciation of his philosophical and psychological work, and toward this end, in relative isolation, he worked steadfastly and continuously for seventy years. That task now falls to others.

The aim of this essay, however, is not to take up where Kantor left off, but rather to describe his intellectual contributions, particularly as they pertain to the science of psychology. It is intended as a guide to further study.

### *Preparation for a Career in the Sciences*

In his book, *Cultural Psychology* (1982, p. 232) Kantor addresses the issue of conventional versus idiosyncratic reactions to stimuli, arguing that a predominance of idiosyncratic behavior traits in the personality equipment of an individual is a product of that individual having been culturalized under the auspices of multiple collectivities (i.e., groups of persons sharing common reactions to stimulus objects). Among the idiosyncratic reactions of an individual, he includes intelligent and rational behaviors on the grounds that these activities exemplify

variability and heterodoxy, the opposite of conformity (p. 290). In his words:

To be psychologically dominated by circumstances or a group is *ipso facto* not to be intelligent. To be intelligent one must be different even though one may be wrong. To be reasonable one must decide a problem oneself even though one is in danger of starting from wrong premises. (1982, p. 291)

In keeping with this analysis, Kantor (1976) describes his own intellectual development as one of having had opportunities to compare and contrast the political, economic, social, religious and other practices of different cultures, as a result of having been born into a family recently arrived in America from foreign shores. To these opportunities he attributes his traits of observation, of critical comparison, and his urgency to correct undesirable intellectual traditions. The particular outcome of these circumstances he describes as "an early deep-seated naturalism in the sense that knowledge and intellectual orientation in general can only be based upon direct observation of the way things and events actually existed and changed by virtue of their specific coordinate circumstances" (1976).

It was armed with this naturalism, and an increasing realization that much of what man was thought to know had its sources in traditional pronouncements rather than actual observations of events, that Kantor entered the University of Chicago, sometime around 1910, with philosophic interests and plans to pursue an academic career in the sciences. Psychology became the discipline of choice for two reasons, the first of which was his fascination with the subject matter. But more important, he had come to believe that many of the insufficiencies of both philosophy and science were traceable to inadequate psychological formulations

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(Kantor, 1976), a belief that he never abandoned.

*Functionalism and Organismic Psychology*

James Roland Angell was the Chairman of the Department of Psychology at this time and Functionalism was the prevailing psychological doctrine. What influence the Functional school had on the development of Kantor's psychological position is unclear, however, since apart from a common vocabulary of psychological terms, Kantor's organismic Psychology, as it was then called, bore little resemblance to Functionalism. As is well known, Functionalism grew out of ecological biology and, more specifically, Darwinian evolutionary theory. H. A. Carr's "adaptive act" (Lundin, 1979) reflects this heritage in an obvious way. For Carr, as well as for Angell, adaptation involved some modification of an organism's condition brought about by psychological conduct such as to enhance the organism's chances of survival. That is, adaptive acts served utilitarian purposes. Kantor also makes use of the concept of adaptation, although not in a technical way. For Kantor, as for the Functionalists, adaptation referred to modifications in an organism's condition brought about by psychological activity (Kantor, 1977, p. 75), however these modifications might hinder as well as enhance the organism's chances of survival. In other words, Kantor rejected the implicit teleology of the Functionalists' position.

Likewise, both Functionalism and Organismic Psychology make use of the concept of functionality, although here again the meaning of this term differs markedly across the two formulations. For Angell and Carr "function" referred to that which a thing *does*, and more specifically, the actions of the mind in mediating an organism's contact with its en-

vironment. Kantor, on the other hand, borrowed this concept from the science of mathematics wherein it referred to a commutative relation between two elements. As such, in Organismic Psychology "function" referred to the commutative relation obtaining between the responding of an organism and the stimulating of an object.

Moreover, Kantor completely abandoned the concept of a transcendental mind. It was, in fact, the historical dichotomy of mind and body, originating under the auspices of early Judeo-Christian culture, that Kantor felt was the principal source of inadequacy in traditional psychology, philosophy, and in the many other sciences in which the actions of man perceiving, observing, and knowing had to be taken into account (Kantor, 1963). The name, Organismic Psychology, was adopted by Kantor as a means of drawing attention to the fundamental naturalism of his position in contrast to all other prevailing positions. Psychology was the science of concrete interactions between the biological *organism* and the physical environment.

One genuine similarity between Functionalism and Organismic Psychology was an emphasis on the context in which a psychological event is taking place. Carr (Lundin, 1979) argued that the nature of an adaptive act depended upon the context in which it occurred: There was a difference between the way one reacted to a bear at the zoo and the way one reacted to a bear encountered in the woods, for example. Kantor also noted the significance of the setting in which a psychological event took place, however, because he explicitly distinguished between stimulus objects and their functions, as well as between responses and their functions, the role of setting factors was able to be articulated more precisely. The setting determined which of a number of possible functions might obtain in the event of a copresence of a given organism and a given stimulus object. Moreover, the incorporation of a concept of context or setting in the technical formulations of Functionalism and Organismic Psychology distinguish these positions from those of the early

<sup>1</sup> The name "Organismic Psychology" was first introduced by Kantor in 1921. The term "organismic" came to be associated with a position unlike Kantor's, however, and sometime prior to 1937, he adopted the name "Interbehavioral Psychology" to distinguish his formulation from other organismic positions (Kantor, 1971, p. 64, footnote).

Associationistic Behaviorists, including Pavlov and John B. Watson. In their systems, which are essentially the same, no paradigmatic significance is afforded the larger context in which psychological events are taking place.

It is by no means certain, however, that Kantor's position was influenced in this regard by Functionalism. More likely both the Functionalists and Kantor owed a debt to Darwin on this issue. Kantor was a great admirer of Darwin's (1969a, p. 307; 1959a) and while he did not feel that Darwin's concept of sexual selection had anything to recommend it (Kantor, 1935), he cites among the benefits derived from evolutionary theory a stress on the specificity of concrete happenings and *the fields of factors making up the settings in which such happenings occurred* (1959b).

Perhaps the only real influence of Functionalism on Organismic Psychology pertained to the kinds of issues and problems addressed by the two positions in their initial states. Functional psychologists had embraced William James' dictum that the adequacy of any theoretical formulation was best evaluated in terms of its utility, and the test to which functionalistic theory was put pertained to problems of psychological maladjustment. Two of Kantor's earliest papers, "Conscious behavior and the abnormal" (1918a) and "Human personality and its pathology" (1919a) addressed the issue of psychological maladjustment, and since this topic commanded little of Kantor's attention after this point, it is likely that the concerns of his teachers provided the impetus for these papers. The most significant features of his treatment of maladjustment included an explicit rejection of mind-body dogma and the beginnings of a distinction between the subject matters of psychology and biology, a theme to become elaborated in considerable detail throughout many of his later writings.

### *Organismic Psychology*

Before completing his doctorate, Kantor took a position in the then joint Philosophy-Psychology Department at the

University of Minnesota. It was during this period (1915–1917) that Organismic Psychology, under the pressure of having to explain his position to students, began to become systematized (Kantor, 1976). Systemization necessitated commerce with a valid philosophy, however, and no such philosophy existed. Hence it became necessary to construct a new philosophy, and upon this foundation, a new science of psychology. Kantor's dissertation, entitled "The functional nature of philosophical categories," completed in 1917, marks the beginning of a life-long preoccupation with the relation between philosophy and science, one that he regarded as mutually beneficial.

Kantor remained at the University of Chicago as an Instructor of Psychology until 1920 when he and his wife, Helen Rich Kantor, whom he had met and married in Minnesota, moved to Indiana. In this same year he published a paper entitled "Suggestions toward a scientific interpretation of perception." His interest in this topic arose out of two considerations. In the first place, perception was an integral phase of observational activity and it was by way of such activity that valid scientific constructions such as descriptions, laws, and principles could be developed. So central were constructions of this sort to the scientific enterprise as a whole and to the task of scientific system building in particular, that he felt compelled to provide an interpretation of constructional practices, including their observational and perceptual bases.

Secondly, the traditional (i.e., Newtonian) model of perceptual activity was badly in need of reconstruction. According to this model, the stimuli with which an organism made contact consisted of formless, colorless, indifferent quanta of energy on the basis of which the mind produced "experiences" or "sensations" of objects and their so-called secondary properties. As such, the colors, sounds, tastes, textures, etc. of objects were regarded as mental or psychic qualities. From Kantor's perspective, the traditional model embodied a confusion of the stimulatory properties of objects with the media through which psychological interactions with those objects

could take place. For Kantor, color was a property of an object, not a creation of the mind; and energies, such as light, were media of contact, not stimuli. All psychological events were regarded as occurring through some such medium. Olfactory interactions with odorous objects, for example, occurred through a medium of air, as did hearing interactions with sounding objects. Likewise, taste reactions were mediated by liquid solutions of various sorts. It was to avoid the confusion of contact media with stimuli that the former were articulated as a formal construct in Kantor's psychological system.

Over the next seven years, Kantor published approximately thirty-three papers addressing both philosophical and psychological issues. The philosophy papers of this period concerned such issues as realism (1919b) and ethics (1918b, 1923a). All were critical analyses of traditional treatments of these topics, the main contention being that historical philosophers had failed to adequately distinguish between events and verbal constructions derived from them, and for this reason had failed to establish rules by which scientifically legitimate constructions could be derived. He believed that legitimate constructions in both philosophy and science consisted of generalized descriptions of observed happenings and, as such, could not include references to nonexistent things and events: Constructions had to be continuous with events. Any break in this continuity, as when constructions included references to psychic or mental phenomena, merely indicated an unhealthy commerce with traditional metaphysics.

The psychological papers and chapters appearing in print prior to 1924 address an enormous variety of topics. Major themes include: the role of biological factors in psychological events (1920a, 1922a, 1923b, 1920b); affective action (1921a, 1921b, 1923c); perception (1920c, 1922b); complex human behavior (i.e., intelligent action, 1920d; memorial action, 1922c; linguistic action, 1922d; meaning reaction systems, 1921c;

and volitional behavior 1923d); acquisition and maintenance of behavior (1921d, 1922e, 1922f) and Social Psychology (1921–22a, 1921–22b, 1922–23, 1923e, 1923f, 1923–24). The substance of many of these works appeared in his first book, *Principles of Psychology*,<sup>2</sup> published in two volumes, in 1924 and 1926, respectively. As the name of Kantor's first book suggests, it was intended as a successor to earlier works of the same name written by Herbert Spencer (1883) and William James (1890). Spencer and James had attempted to achieve for their discipline the status of a natural science by way of its attachment to biology, arguing that the mind and mental processes could be identified with the workings of the nervous system, and that psychological performances had their origins in these workings. By contrast, Kantor's *Principles* was an attempt to demonstrate that all psychological events, from the most simple to the most complex, could be described at a *psychological* level of analysis, and in completely naturalistic terms.

Kantor's psychological formulation also differed from those of the early behavioristic psychologists, of whom J. B. Watson may be considered representative. The principal difference, in this regard, concerned the way in which responses and stimuli were conceptualized.

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<sup>2</sup> A simpler version of *Principles of Psychology* was published in 1933 for use as an introductory text book, under the name *A Survey of the Science of Psychology*. The latter was subsequently revised in 1975 under the name *The Science of Psychology: An Interbehavioral Survey* (with Noel W. Smith). The Kantor and Smith volume has the advantage of a more modern writing style, and includes interbehavioral interpretations of classic and contemporary research projects and problems. This volume also includes a section on statistics, which was lacking in the original volume. Despite Kantor and Smith's comment that the goal of the work has been "to produce a straight-forward presentation of scientific psychology without yielding to the allurements of a competitive book market to shape its contents or style for commercial advantage" (1975, XV) I believe this volume would serve well as an introductory text book.

From Watson's perspective, responding amounted to muscular movements or glandular secretions, elicited by stimuli, the latter conceived as concrete objects or various forms of energy. By this analysis the psychological event was localized in or about the organism: Psychology was the study of the reflexive activity of various parts of the organism, over which causal control was exerted by stimuli. Kantor departed from this tradition. On the issue of response definition, he objected to the view that psychological performances were enacted by parts of organisms. Muscular, glandular, and neural activities, among others, were obviously involved in a psychological response, however these activities were not assumed to constitute complete and independent reactions of the psychological type. Instead, they were regarded as sequential *phases* of an integrated response enacted by the whole organism. With regard to stimuli, because a variety of different responses were possible of occurrence in the presence of the same object, Kantor felt it necessary to distinguish between objects and their stimulating actions (i.e., their stimulus functions). Moreover, it was the stimulating action of such objects and not the objects themselves that had psychological significance. Objects, as objects, were merely sources of stimulation.

Given these conceptualizations of the fundamental categories of stimulus and response, Kantor argued that the basic psychological datum was the *function* obtaining between the stimulating of an object and the responding of the whole organism. Further, because stimulating and responding were themselves regarded as phases of a unitary phenomenon—a functional relation—neither could be interpreted as the cause of the other. From Kantor's perspective, questions of causality were motivated by a desire to implicate some more fundamental process (i.e., mental facilities or neural mechanisms) than the details of actual happenings in the explanation for psychological conduct (1926, p. 356); and because such implications were to him neither neces-

sary nor useful, the question of causality was left unanswered.

### *Specialized Studies in Organismic/Interbehavioral Framework*

Upon completion of *Principles of Psychology* in 1926, Kantor began to consider areas of psychological study in greater detail, among them, social psychology, the psychology of language and grammar, and physiological psychology. These considerations led to three books on these topics, appearing in 1929, 1936, and 1947 respectively. The contents of these volumes are described below.

*Social Psychology.* Over the six year period during which *Principles of Psychology* was in preparation (Kantor, 1924, xix), nine articles on the topic of social psychology appeared in a variety of sources, including the *American Journal of Sociology* (Kantor, 1921–22a, 1921–22b); the *Journal of Abnormal and Social Psychology* (Kantor, 1922–23, 1923c); and the *Journal of Philosophy* (Kantor, 1923a, 1923b), among others. Five of these early articles were also reprinted in an edited volume entitled *The Aim and Progress of Psychology and Other Sciences* (Kantor, 1971).<sup>3</sup> Taken together, these papers constitute a critical commentary on the dreadful state of affairs of Social Psychology during the early part of the 20th century and a reformulation of this subdivision of psychology with respect to philosophical orientation and subject matter.

Traditional conceptions of Social Psychology were rejected for a variety of reasons (Kantor, 1971, p. 346). For example, the view that Social Psychology is the study of groups was rejected on the grounds that group phenomena were sociological not psychological phenomena,

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<sup>3</sup> *The Aim and Progress of Psychology and Other Sciences* is an excellent collection, including a number of very significant papers on a variety of topics published over a 55 year period, and for these reasons constitutes a good text for an advanced seminar on the evaluation and current status of Interbehavioral Psychology.

indicating a failure on the parts of those holding this view to differentiate between these two sciences on the basis of their unique subject matters: Psychology was the study of individual behavior (Kantor, 1923e). Group mind and psychic forces interpretations were criticized, as might be expected, as having no basis in actual fact (Kantor, 1923e). Traditional views of Social Psychology as the study of socialization processes were rejected for two reasons. First, socialization processes were articulated with regard to only certain types of behavior, such as the development of language, myth, religious custom, and similar large group facts of an enthrographic character, thereby neglecting the analysis of technical, professional, artistic, and other equally relevant sorts of collective activities. Secondly, because ethnographic phenomena could only be described in statistical terms, the details of individual social adjustments, (i.e., actual psychological facts) were left out of consideration (Kantor, 1923e). The remaining traditional conceptions, including those postulated on the influence of single types of psychological behavior, such as imitation or aggression, and those assuming that the essential data of Social Psychology were the reactions of individuals to other persons,<sup>4</sup> were rejected as being too exclusive in the former case, and too inclusive in the latter.

In contrast to these formulations of Social Psychology, Kantor proposed the view that Social Psychology was the study of common reactions of individuals to objects and conditions which had acquired generalized stimulus functions. The common reactions, called cultural behaviors, and the common stimulus functions, called institutional functions, arose and became coordinated under the auspices of particular group circumstances. This subject matter he regarded as naturalistic and confrontable, distinctly psychological, and sufficiently unlike other forms of psychological conduct to warrant separate treatment (Kantor,

1923f). This thesis, as well as his criticisms of traditional conceptions of Social Psychology, were elaborated in detail in his 1929 book, *An Outline of Social Psychology*. In addition to these topics, Kantor also addressed the relations sustained among social psychological phenomena and the other psychological and nonpsychological facts with which they were inevitably connected. Among these facts were idiosyncratic behaviors (i.e., behaviors acquired under personal as opposed to group auspices), biological activities, and anthropological, sociological, historical, and natural circumstances.

In 1982, Kantor published a revision of this volume under the title *Cultural Psychology*. By this time, of course, the postulates and principles of Interbehavioral Psychology had been fully articulated, and the revision reflects this evolution. Like *An Outline of Social Psychology*, *Cultural Psychology* was intended as reformulation of Social Psychology and is, in my opinion, one of Kantor's finest contributions.<sup>5</sup>

*Psychology of language and grammar.* Kantor's interest in speech and other forms of communication date back to his days as a graduate student at the University of Chicago (Kantor, 1976). His doctoral dissertation concerned the terminology employed by traditional philosophers in their epistemological and ontological speculations, and constituted a critique of their belief that philosophical categories (i.e., words) were independently existing realities rather than constructions showing the influence of particular workers, operating under particular cultural auspices. This theme was elaborated in several papers published during the period from 1922 to 1938,<sup>6</sup>

<sup>5</sup> Kantor (personal communication, May 30, 1983) believed he had finished his "psychological program" as he called it, with the revision of *An Outline of Social Psychology*. *Cultural Psychology* was his last psychological volume.

<sup>6</sup> An analysis of psychological language data, *Psychological Review*, 1922d, 20, 267-309; Can psychology contribute to the study of linguistics? *Monist*, 1928, 38, 630-648; Language as behavior and as symbolism, *Journal of Philosophy*, 1929b, 26, 150-159; The role of language in logic and science, *Journal of Philosophy*, 1938a, 35, 449-463.

<sup>4</sup> For a discussion of such phenomena, see the chapter on Interpersonal Reactions in *Principles of Psychology*, Vol. II.

and eventuated in a book entitled *An Objective Psychology of Grammar*, published in 1936. In this work Kantor attempted to study grammatical phenomena from an objective psychological point of view. A major portion of this book was devoted to a critique of conventional studies of language, wherein the word was interpreted as the primary datum. From Kantor's perspective, words were language *things*, not linguistic adjustments, and a science of speech could not be expected to arise by way of word study. In opposition to conventional linguists, Kantor argued that grammar problems could be addressed on the basis of actual linguistic behavior, and proposed the view that all grammars consisted of styles of communicative adjustment reflecting the personal and cultural histories of individual speakers.

Linguistic adjustments, like all psychological occurrences, were interpreted as commutative relations between stimulating and responding. They differed from other psychological performances only in the fact that speech adjustments were bistimulational, while nonlinguistic adjustments were unistimulational (Kantor, 1936a, pp. 73-74). That is, in any given instance, two stimulatory functions were simultaneously coordinated with a single response function. The response function in each case was the speech activity of an individual speaker coordinated with stimulus functions having their sources in a listener, on one hand, and with the thing or event spoken of, on the other. This bistimulational analysis made for a referential interpretation of linguistic activity: a speaker (i.e., referor) was said to refer someone (i.e., a referee) to something (i.e., a referent). It is not possible to present the details of this analysis in this paper, however the interested reader is referred to an excellent discussion of Kantor's views on this topic by Schoenfeld, appearing in the *Journal of the Experimental Analysis of Behavior* in 1969.

After the publication of *An Objective Psychology of Grammar*, Kantor continued to apply himself to problems of linguistic adjustment. Between the years of 1936 and 1976, approximately 12 papers

on this topic were published, the majority of them appearing in *The Psychological Record*, a journal established in large part through Kantor's efforts in 1937. 1977 marks the year of a second volume on this topic entitled *Psychological Linguistics*.

Apart from the evolution of Organismic Psychology into the integrated field approach of Interbehavioral Psychology, which had reached completion by 1976 and was apparent in *Psychological Linguistics*, the basic analysis of linguistic conduct remained the same. The principal difference between these two volumes is one of focus. In 1936, Kantor's aim was to clarify the distinction between language acts and language things, drawing him into dialogue with traditional linguists. In 1977, his aim was to distinguish between language acts and nonlanguage acts. As a result, the 1977 volume provided a detailed discussion of various categories of linguistic conduct, including referential and symbolic adjustments, and their points of departure from performances of nonlinguistic character, including such events as echoic behavior and vocal or gestural greetings of various forms (Kantor, 1977, p. 75).

Kantor's formulation of linguistic conduct is quite unlike those of other behavioristic psychologists, notably that of B. F. Skinner (1957). It is a comprehensive, naturalistic and decidedly systematic approach, however, which I believe may be of considerable interest to operant psychologists, particularly with regard to Kantor's treatment of the listener's role in such interactions.

*Physiological Psychology.* From Kantor's perspective, the things and events of nature and culture were all of one piece, a continuously evolving interactive whole. Knowledge of that whole was not possible of accomplishment in the absence of investigations into more limited aspects of it, however. Hence it was incumbent upon the special sciences to claim interests in particular aspects of the whole for specialized study and investigation. Because the events of nature did not exist *in nature* as isolated entities, however, the entities isolated by the various sciences for specialized study were



products of constructional or logical activities, and the knowledge acquired with respect to these entities were, likewise, products of logical operations. In other words, all scientific descriptions, definitions, laws, principles and theories were verbal constructions. They were, of course, derived from repeated observations of the events of nature, but were not themselves those events and it was imperative to avoid a confusion of one with the other.

This being the nature of science, and given that the ultimate goal of the scientific enterprise was the reformulation of the various facts of specialized knowledge into an understanding of the whole of nature, it was necessary for each science to operate in accordance with a consistent and common set of ground rules or postulates regarding their relations with other sciences. Otherwise, there would be no possibility of fruitful exchange among the various sciences and no progress toward an understanding of the whole.

The need to distinguish among the various departments of knowledge, as well as the need to establish rules in accordance with which their legitimate interrelations could be articulated, was regarded by Kantor as especially acute for those sciences whose subject matters tended to overlap. Such was the case of Biology and Psychology. It was always a biological organism who participated in a psychological event, and the nature of that participation had directly or indirectly preoccupied psychologists and biologists for centuries (Kantor, 1976). Historical solutions to the problem of this relationship, among them psychophysical parallelism, interactionism, and identity, had all been fruitless from Kantor's perspective, and he took it upon himself to propose a new solution to this problem. His thinking on this issue evolved over a twenty-five year period beginning in 1920 (Kantor, 1920a) and culminating in a book on this subject published in 1947, entitled *Problems of Physiological Psychology*. The essence of his solution to the relation between Biology and Psychology was that biological factors par-

ticipated in psychological events, such as to facilitate or hinder their occurrence, but were neither the bases of psychological events nor the causes of them.

*Problems of Physiological Psychology*, in addition to being a forum for Kantor's own solution to the problem of interdisciplinary relations, is also a history of inadequate solutions to this problem and their philosophical and theological sources. And because it is addressing not so much the specific findings of investigations but rather their interpretations, it remains a valuable and contemporary commentary on the nature and problems of physiological psychology. It is highly recommended reading for anyone interested in these issues.

#### *Philosophical Investigations and the Development of Interbehavioral Psychology*

Kantor had always been interested in the logic of science, publishing a paper on this topic as early as 1919. Other interests, namely the formulation of Organismic Psychology and more detailed speculations as to the nature of Social Psychology and psychological linguistics, had occupied his time over the following decade, however, and he did not return to problems of logic and philosophy until the 1930's. In 1929, he published a paper entitled, "Philosophical implications of organismic psychology," in which he argued that the absolutistic tradition in philosophy was based on invalid psychological conceptions wherein activities, such as thinking and reasoning, were regarded as psychic processes. Through such activities man was held to be capable of knowledge beyond the boundaries of observation, giving rise to the view that logical procedures were all-embracing and universally valid. When thinking and reasoning were properly conceived as subtle interactions of persons with their stimulating environments, however, philosophy was left with no basis upon which to speculate concerning the world in general.

Having thus done away with almost

the whole structure of traditional philosophy, Kantor proceeded to describe a logic of specificity wherein logical activities were interpreted as acts of individual logicians working with particular materials under particular cultural circumstances, resulting in products bearing the unavoidable stamp of those particulars. This was also the nature of scientific activity, the only difference between philosophy and science being the kinds of materials with which each was concerned, as was, in fact, the only fundamental difference between one science and another. Scientists of every variety operated upon things and events of the natural world, from which eventuated products having the form of theories, laws, principles and hypotheses. Philosophy, in turn, operated upon these products such as to discover their ideational background, their harmony with the events from which they were derived, and their consistency across the various scientific disciplines. In other words, philosophy too was a science—a science of critical evaluation.

This analysis was elaborated in a number of papers appearing throughout the 1930's and early 1940's (Kantor, 1932, 1936b, 1938a, 1938b, 1939, 1940, 1943) and eventuating in a two volume treatise on the relationship between Philosophy and Psychology entitled *Logic and Psychology*, published in 1945 and 1950.

The central thesis of both volumes was that logic or technical philosophy was the process of scientific system building, and because the first stage of any system building effort was the explication of a set of guiding assumptions, the postulates of Kantor's specificity logic were presented in the first chapter of Volume I. The remainder of Volume I was devoted to general issues, among them the cultural and historical development of logic and psychology, the relationship between these two disciplines, the place of language and symbols in logic, and the nature of thinking and reasoning.

The second volume of *Psychology and Logic*, published in 1950, constituted a thorough description of specific logical

operations and their products. Among the topics covered were: abstracting, generalizing, defining and classifying operations; the laws of thought and things; probability; measurement; and the causal principle in logic and systematics. The discussion of causality in this volume warrants further comment, as it is by way of this analysis that the integrated field approach of Interbehavioral Psychology came to be formulated.

*Causality in interbehavioral perspective.* Kantor addresses the problem of causality by tracing the development of this concept throughout history, showing an evolution in its meaning from acts of personal creation, through an all embracing principle to account for everything that happened, to the view that causes were rules of order and regularity conjoining with problems of predicting and controlling future happenings. The outcome of this evolution, he argues, was a replacement of causality interpreted as a kind of potency or productivity with the concept of functionality. Even this conceptualization was problematic, however, since, as a result of cultural tradition, there remained a dissatisfaction with the simple association of factors lacking any efficacy with respect to each other (Kantor, 1950, pp. 156–157). Hence, causal correlations or functions were regarded as special sorts of factorial combinations, implying conjunctions of potencies of various sorts. In opposition to this view, Kantor argued that causation was indeed an effective combination of factors, but not one resulting from a conjunction of potencies. Causation resulted from *changes in event fields*. In Kantor's words: "Causal changes in any field constitute a rearrangement in the simultaneous co-existence of factors in a unique pattern" (Kantor, 1950, p. 157). As such, causal description amounted to an enumeration of the factors participating in a given causal situation; and causal knowledge was interpreted as knowledge of the pattern of events making up that situation (Kantor, 1950, p. 174). Moreover, because each situation was constituted of different component factors organized in

a unique way, all vestiges of ultimacy, universality and absoluteness in causal interpretations were wiped out.

The implications of this position for science, and for psychology in particular, were enormous: Psychological events, for example, were postulated as occurring without any internal or external causative determiners. As such, all references to mental states, instincts, drives, innate capacities, and other intervening variables, as explanations for psychological conduct, were rendered unnecessary. Further, and it is this item which is most significant from the standpoint of other behavioral psychologies—the causal potencies assumed to inhere in stimulus objects, such as their strengthening, eliciting, and selecting powers, were also regarded as unnecessary impositions upon events that had no basis in actual observations of those events. In other words, psychological conduct was not interpreted as being caused by stimulation arising from the environment.

I believe it was this analysis, which had been developing over several years in a philosophical context, that led to the explicit articulation of Interbehaviorism as a naturalistic, integrated field theory, and which distinguished Interbehavioral Psychology from the earlier formulation known as Organismic Psychology. The fact that a postulate denying the need for internal or external determiners of psychological conduct, the hallmark of a field theoretical position, does not appear prior to 1959 suggests this interpretation. As of 1959, with the publication of *Interbehavioral Psychology: A Sample of Scientific System Construction*, and in all subsequent expositions of Kantor's systematics (see Kantor and Smith, 1975, for example), this assumption is included as a formal postulate. As a point of clarification, the denial of internal and external determiners of psychological conduct does not imply capriciousness or indeterminacy. Assumptions of determinacy as well as indeterminacy in science were regarded by Kantor as having originated in dualistic intellectual tradition, not concrete observation (Kantor, 1950, p. 173). In short, the alternative to

determinism in science was not indeterminism, but interdeterminism or interactionism.

*Psychology and Logic* is by no means a simple treatise. Despite Kantor's attempt to address the interrelations of these two sciences in such a way as to enable both philosophers and psychologists to appreciate his position (Kantor, 1945, preface), considerable background in traditional philosophy and a general familiarity with Interbehavioral Psychology is required for an understanding of Kantor's views on these issues. For this reason *Psychology and Logic* is not recommended for the novice reader.

*Psychology and Logic* was closely followed by a third volume, entitled *The Logic of Modern Science* (Kantor, 1953). In this work he argued convincingly that scientific workers had not escaped the influence of transcendental metaphysics and that this influence had interfered with their ability to describe events solely on the basis of their actual confrontations with them. As a result, descriptions of events tended to include references to factors not found among them, such as mental processes and depositories of various sorts, and powers or forces presumed to be responsible for the occurrence and maintenance of observed happenings. From Kantor's perspective success in science depended upon a continuity of postulation and observation, which he regarded as impossible of achievement under the influence of traditional metaphysics. His task in this book was to alert scientific workers to the assumptions upon which they knowingly or unknowingly operated, the historical origins of those assumptions, and their influence upon scientific operations and their products. The relation between philosophy and science he believed to be thoroughly reciprocal. Each was influenced by the other, and for this reason he felt it imperative for scientists to be aware of their philosophical foundations.

*The Logic of Modern Science* is a welcome alternative to more traditional works on the methodology and philosophy of science, and an understanding of Kantor's views on these issues does not

depend on a familiarity with more traditional treatments of them to the same extent as does *Psychology and Logic*. For this reason, *The Logic of Modern Science* is highly recommended as an introduction to Kantor's analysis of the role and significance of philosophy in scientific system building efforts.

A final treatise on technical philosophy appeared in 1981 entitled *Interbehavioral Philosophy*. As always, Kantor's strategy was to provide a critical survey of historical problems in philosophy followed by an exposition of a new philosophy, erected in accordance with the postulates of specificity logic and in concert with the principles of Interbehavioral Psychology. In the final section of the book, various disciplines, including linguistics, ethics, politics, economics, aesthetics, education, religion, law and history are discussed in philosophical perspective. Like *Psychology and Logic*, *Interbehavioral Philosophy* assumes a familiarity with traditional philosophy and is not recommended for the novice.

#### *Psychological History in Interbehavioral Perspective*

Kantor left the University of Indiana in 1957 at the age of 69, shortly after the death of his wife, and moved with his daughter, Helene, to Chicago where he held the position of Professor Emeritus at the University of Chicago until his death in 1984. Upon returning to Chicago he set out "to correct the lack of factual treatment of the career of psychology as a scientific discipline, and undertook to trace the evolution of psychology as a science" (Kantor, 1976). These efforts eventuated in a two-volume history entitled *The Scientific Evolution of Psychology*, completed in 1963 and 1969.

In these volumes the career of psychology is divided into four periods, beginning with the naive naturalism of Aristotle and his predecessors, through the centuries-long domination over scientific thinking by religious authority, to the rise of the biological sciences and their im-

plications for the misinterpretation of psychological events, culminating in the behavioral revolution of the twentieth century. In no other source is Kantor's enormous scholarship more apparent than in these two volumes: All sources are primary, and references are given in the languages of the original writers. Moreover, because it was not possible to describe the career of psychology in isolation, Kantor's history is essentially a history of the confederation of sciences, including philosophy, set in a changing and explicitly detailed cultural matrix.

Kantor's book on the evolution of scientific psychology was and still is the only attempt to describe the history of psychology from a naturalistic and objective standpoint. It stands alone among histories of our discipline. As a text for a graduate level course on the history of psychology, some supplementation with regard to the recent cognitive revival in psychology and the cultural circumstances responsible for it may be necessary given the publication date of the second volume.

#### CONCLUDING REMARKS

I have tried in the essay to provide an overview of Kantor's contributions to philosophy, and science, with special emphasis on the science of psychology. To describe the career of J. R. Kantor in detail, along with the implications of his radical thought for all of the disciplines to which it was applied, would consume the career of anyone undertaking the task, and such has, of course, not been my objective. Many contributions have had to be overlooked.<sup>7</sup> Instead, I have tried to touch upon what to me have been some of his most significant contributions and offer this essay as a guide to further study of the works of this great scientist.

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<sup>7</sup> A more complete bibliography of Kantor's works appears in the *Mexican Journal for Behavior Analysis*, 1976, prepared by Noel W. Smith. In addition, a collection of Kantor's comments in *The Psychological Record* (1956-1984), under the nom de plume, Observer, is available from The Principia Press.

As a fitting conclusion to these remarks I would like to mention one last contribution. In 1983 Kantor published a rather unusual volume entitled *Tragedy and the Event Continuum*. It was his last major philosophical work which, in his words, (Kantor, personal communication, June 1, 1983), brought his philosophical program to completion. In it he defined tragedy as a truncation of potential.

In keeping with this definition we may conclude that Kantor's death was anything but tragic: Little more could be expected of any one man. Nor was the lack of recognition afforded him during his lifetime a tragedy, as it was this lack of understanding and acknowledgement that contributed to the realization of his potential. It would be a tragedy, however, if the potential for change in our intellectual life, made possible through the teachings of J. R. Kantor, were truncated by the weight of ignorance and tradition.

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